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IS 3441 (1982): Solvent Extracted Groundnut Oilcake (Meal)
as Livestock Feed Ingredient [FAD 5: Livestock Feeds,
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Indian Standard REAFFIRMED
SPECIFICATION FOR
SOLVENT EXTRACTED GROUNDNUT
OILCAKE (MEAL) AS LIVESTOCK
FEED INGREDIENT
(*First Revision*)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR SOLVENT EXTRACTED GROUNDNUT OILCAKE (MEAL) AS LIVESTOCK FEED INGREDIENT (*First Revision*)

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(*Continued on page 2*)

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IS : 3441 - 1982

(Continued from page 1)

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(Continued on page 8)

IS : 3441 - 1982

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AMENDMENT NO. 1 OCTOBER 1995
TO
IS 3441 : 1982 SPECIFICATION FOR SOLVENT
EXTRACTED GROUNDNUT OILCAKE (MEAL) AS
LIVESTOCK FEED INGREDIENT
(First Revision)

(Page 4, clause 3.1, line 5) — Substitute 'IS 1713 : 1986†' for 'IS : 1713 - 1970†'.

(Page 4, foot-note with '†' mark) — Substitute '(second revision)' for '(first revision)'.

(Page 6, clause 6.2, line 2) — Substitute 'IS 1070 : 1992*' for 'IS : 1070 - 1977*'.

(Page 6, foot-note with '*' mark) — Substitute 'Reagent grade water (third revision)' for the existing foot-note.

Indian Standard
SPECIFICATION FOR
SOLVENT EXTRACTED GROUNDNUT
OILCAKE (MEAL) AS LIVESTOCK
FEED INGREDIENT
(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 April 1982, after the draft finalized by the Animal Feeds Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Oilcake (meal), obtained from groundnuts (*Arachis Hypogaea* Linn.), by the solvent extraction process is a rich source of protein and is being extensively used as a protein supplement in livestock rations. Since a number of years, this has been an important item of export and its production is constantly increasing as a result of the rapid expansion of the solvent extraction industry in India. It is expected that this standard will help in the proper utilization of this material. Inclusion of the aflatoxin limit in the standard did not find favour with the Committee at this stage because of non-availability of a reliable and quick method for its determination. Further, data for fixing a safe limit in the product meant for livestock feed was also not available. However, it was a considered view of the Committee to fix this limit as early as possible.

0.3 This standard was first published in 1966. The Committee in the present revision took note of the latest development in the manufacturing, trading, storing and consumption pattern of the product and accordingly the requirements were modified. Opportunity was also taken to align the test methods for various requirements to IS : 7874 (Part I)-1975*.

0.4 In the preparation of this standard due consideration has been given to the provisions of the solvent extract in orders. However, this standard is subject to the restriction imposed under that wherever applicable.

*Methods of tests for animal feeds and feeding stuffs: Part I General methods.

IS : 3441 - 1982

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for solvent extracted groundnut oilcake (meal) used as livestock feed ingredient.

2. GRADES

2.1 Solvent-extracted groundnut oilcake (meal) shall be of two grades, namely, Grade 1 and Grade 2.

3. REQUIREMENTS

3.1 Description — The solvent-extracted groundnut oilcake (meal) shall be obtained by extraction of oil by means of a solvent from the expeller or *GHANI* pressed groundnut oilcake used. Oilcake for extraction shall have been obtained by pressing clean and sound groundnuts and shall conform to IS : 1713-1970†. The meal shall have been subjected to heat and steam treatment under controlled and regulated conditions so as to remove traces of solvent. The material shall be in the form of either flakes or powder and shall be free from harmful constituents and castor oilcake, husk and *MAHUA* cake when tested according to the methods prescribed in Appendices A and B. It shall also be free from rancidity, adulterants, insect or visible fungus infestation and from musty odour.

3.2 Solvent for Extraction — Only hexane of food grade conforming to IS : 3470-1966‡ shall be used for extracting groundnut oilcake.

3.3 The material shall also conform to the requirements prescribed in Table 1.

4. PACKING AND MARKING

4.1 Packing — Unless otherwise agreed to between the purchaser and the vendor, the material shall be packed in clean and sound jute bags.

*Rules for rounding off numerical values (*revised*).

†Specification for decorticated groundnut oilcake as livestock feed ingredient (*first revision*).

‡Specification for hexane, food grade.

**TABLE 1 REQUIREMENTS FOR SOLVENT EXTRACTED GROUNDNUT
(*ARACHIS HYPOGEA*) OILCAKE (MEAL) AS LIVESTOCK
FEED INGREDIENT**

(Clause 3.3)

Sl No.	CHARACTERISTIC	REQUIREMENT		METHOD OF TEST, REF TO CL NO. OF IS : 7874 (PART I)- 1975*
		Grade 1	Grade 2	
(1)	(2)	(3)	(4)	(5)
i)	Moisture, percent by mass, <i>Max</i>	8.0	8.0	4
ii)	Crude protein ($N \times 6.25$), percent by mass, <i>Min</i>	51.0	47.0	5
iii)	Acid insoluble ash, percent by mass, <i>Max</i>	2.5	2.5	10
iv)	Crude fibre, percent by mass, <i>Max</i>	7.0	10.0	8

NOTE — The requirements for Sl No. (ii) to (iv) are on moisture-free basis.

*Methods of tests for animal feeds and feeding stuffs : Part I General methods.

The mouth of each bag shall be either machine-stitched or rolled over and hand-stitched. If hand-stitched, the stitches shall be with strong jute twine with at least 14 stitches in each row.

4.2 Marking — Each bag shall be indelibly and legibly marked to give the following information:

- Name and grade of the material,
- Name of the manufacturer,
- Batch or code number,
- Net mass in kg, and
- Date of packing.

5. SAMPLING

5.1 Representative samples shall be drawn and conformity of the material in the lot to the requirements of this specification shall be determined according to the method prescribed in Appendix C of IS : 2052-1979*.

*Specification for compounded feeds for cattle (*third revision*).

6. TESTS

6.1 Tests shall be carried out as prescribed in col 5 of Table 1. Tests for detecting the presence of castor husk and *MAHUA* oilcake shall be carried out as prescribed in Appendices A and B.

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977*) shall be used.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the result of analysis.

A P P E N D I X A

(*Clauses 3.1 and 6.1*)

DETECTION OF CASTOR HUSK

A-0. PRINCIPLE

A-0.1 The method is based on the fact that castor husk is not bleached under the conditions which cause the bleaching of almost all other materials of vegetable origin likely to be present in an oilcake. The method consists of the treatment of the material with dilute alkali and acid solutions followed by treatment with bleaching powder solution and the isolation of the unbleached castor husk.

A-1. APPARATUS

A-1.1 White Photographic Dish

A-2. REAGENTS

A-2.1 Sodium Hydroxide Solution — 5 percent (*m/v*).

A-2.2 Dilute Hydrochloric Acid — 5 percent (*m/v*).

A-2.3 Bleaching Powder Solution — 5 percent (*m/v*), freshly prepared.

A-3. PROCEDURE

A-3.1 Take three separate 100-g portions of the material and boil for 30 minutes with one litre of the sodium hydroxide solution. Filter through muslin, boil again for 30 minutes with one litre of the dilute hydrochloric acid and filter. Digest the residue for a period depending upon the type of the oilcake, with the solution of bleaching powder. When

*Specification for water for general laboratory use (*second revision*).

bleaching is complete, filter off the solution. Spread the bleached residue, in a thin layer, under water, in a white photographic dish. Any black pieces are removed and examined microscopically. After identification, the pieces are compared with portions of castor husk which have undergone the above treatment. Castor husk has a characteristic structure, the sharp-angled black pieces of husk show a distinctive pitted surface, when examined by reflected light under a microscope.

A P P E N D I X B

(*Clauses 3.1 and 6.1*)

DETECTION OF *MAHUA* OILCAKE

B-0. PRINCIPLE

B-0.1 The method is based on the fact that the toxin saponin (*mowrin*) gives a typical colour test when extracted.

B-1. APPARATUS

B-1.1 Extraction Tube — 150 × 13 mm with a taper tip having an internal diameter 1.5 mm.

B-2. REAGENTS

B-2.1 Antimony Trichloride Solution — prepared by dissolving 125 g of antimony trichloride in 300 to 400 ml of chloroform. Add 5 g of calcium chloride and filter while hot. Dilute the filtrate to 500 ml with chloroform.

B-2.2 Rectified Spirit — 95 percent (*v/v*).

B-3. PROCEDURE

B-3.1 Take 10 g of the finely-ground material in the extraction tube. Tap it to pack it well. Pour rectified spirit into the tube so as to soak the sample. Collect the first drop of the extract on Whatman No. 1 filter paper of about 10 cm in diameter. Dry, and then wash by placing 2 to 3 drops of distilled water in the centre of the dried spot. Dry the filter paper completely. Dip the paper in a beaker containing antimony trichloride solution, and then let the paper dry. Heat the paper gently by holding it over a spirit lamp or a burner. Care shall be taken not to overheat the paper which will be evident by its charring. Appearance of a pink colour after heating for five minutes indicates the presence of *MAHUA* oilcake.

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